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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,781	11/26/2001	Henrik Stiesdal	PATRADE	5904

7590 10/23/2002  
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EXAMINER

VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/991,781

Applicant(s)

STIESDAL ET AL.

Examiner

Christopher Verdier

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-- **Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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### ***Drawings***

Figures 1-5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to because in figures 4-5, the enlarged portions must be labeled as different figures, because in figure 7, the separate views must be labeled as different figures, because in figures 8-9, the different embodiments must be labeled as different figures, and because figures 10-11 contain numerous regions that are blurred and unreadable. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informality: Appropriate correction is required.

On page 7, line 3, --, -- should be inserted after "11".

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, line 2, "the rotor blades" lacks antecedent basis. In claim 1, lines 4-5 are unclear as to scope, because lines 2-3 recite that the blades have serrated trailing edges, yet lines 4-5 only recite that the serrations extend from the trailing edge into the airflow behind the trailing edge. Therefore, it is unclear if in lines 4-5 Applicant intends to claim that the serrations are only on a single blade, or on all of the blades. In claim 2, lines 3-7 are unclear as to scope in that it is unclear if Applicant intends to claim that the serrated panel is only on a single blade, or on all of the blades, for the reasons set forth above with regard to claim 1. In claim 3, lines 2-3 which recite that the serrations are provided as part of a new blade are unclear as to scope in that it is unclear if Applicant intends to claim that the serrations are provided only on a single new blade, or on all of the new blades, for the reasons set forth above with regard to claim 1. In claim 4, lines 2-3 are unclear as to scope in that it is unclear if Applicant intends to claim that the serrations are provided only on a single blade, or on all of the blades, for the reasons set forth above with regard to claim 1. In claim 6, lines 2-3 are unclear as to scope in that it is unclear if Applicant intends to claim that the serrations are provided on only on a single blade at an angle different from 0 degrees relative to the blade chord of a single blade, or on all of the blades at an angle different from 0 degrees relative to the blade chords of all of the blades, for the reasons set forth above with regard to claim 1. In claim 7, line 5, "the serrated panel" lacks antecedent basis. In claim 8, lines 4-5, "means for connecting the serrated panel to the trailing edge of the blade comprising the wind turbine rotor" is inaccurate because the "means for connecting" is not the wind turbine rotor, but rather another element. In claim 8, line 5, "the blades" lacks antecedent

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basis. In claim 8, lines 4-7 are unclear as to scope, because line 2 recites a serrated panel that is connected to the trailing edge of the blades, and it is unclear how the single serrated panel can be connected to plural blades. Similarly, claim 8, lines 6-7 recite that the serrated panel extends from the trailing edge into the airflow behind the trailing edge, and it is unclear if Applicant intends to claim a single serrated panel on a single blade, or plural serrated panels on all of the blades. Claim 9 is indefinite for the reasons set forth above with regard to claim 4. Claim 12 is indefinite as to scope in that line 4 recites a single blade, yet the serrations appear to be on plural blades as recited in claim 8. In claim 13, lines 3 and 7 are indefinite as to scope in that they recite a single panel, yet there appear to be plural panels on plural blades recited in claim 8. Claim 13, lines 4-5 which recite "at the trailing edge of the blade" are indefinite as to scope in that they recite a single trailing edge of a single blade, yet there appear to be plural trailing edges on plural blades recited in claim 8.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, 8-9, and 12, as far as they are definite, are rejected under 35 U.S.C. 102(b) as being anticipated by Dassen (figures 1-8). Note that Dassen discloses a method and apparatus for improving the efficiency of a wind turbine whereby the rotor blades 3-5 are furnished with

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serrated trailing edges 6-11, 22-24 with plural span-wise, periodic indentations, with the serrations extending from the trailing edge into the airflow behind the trailing edge. The serrations are provided as a retrofit of an existing wind turbine rotor by attachment of a serrated panel 7 (figure 2) to the surface of the wind turbine blade near the existing trailing edge (column 2, lines 2-3). The serrations may be provided as part of a new blade (column 2, lines 10-11).

The serrations are provided over a spanwise extent of the trailing edge having a length in the range of 30 to 100 percent of the radius of the blade (see figure 1). As shown in figures 2-3, for example, the serrations are provided at an angle different from 0 degrees relative to a chord of the blade. The serrated panel may be fixed to the rear edge of the blade (column 2, lines 1-4), which inherently includes a means for connecting the serrated panel 7 to the trailing edges of the blades. In claim 8, lines 4-5, "means for connecting the serrated panel to the trailing edge of the blades comprising the wind turbine rotor" does not invoke 35 USC 112, sixth paragraph, because the "means for connecting" is modified by the wind turbine rotor being the connecting means.

Alternatively, if the "means for connecting the serrated panel to the trailing edge of the blades comprising the wind turbine rotor" is considered to meet 35 USC 112, sixth paragraph, Applicant has not provided any explicit definition in the specification of the "means for connecting the serrated panel to the trailing edge of the blades", and the means disclosed by Dassen for connecting the serrated panel 7 to the trailing edges of the blades meets the claimed function.

One of ordinary skill in the art would readily recognize that the serrated trailing edges disclosed by Dassen improve the lift and drag, which inherently improves the efficiency of the wind turbine.

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Claims 1, 3-4, 6-7, 8-9, and 12-13, as far as they are definite, are rejected under 35 U.S.C. 102(b) as being anticipated by German Patent 311,416 (figures 1, 3-4, and 6-7). Note that the German Patent discloses a method and apparatus for improving the efficiency of a wind turbine u whereby the rotor blades a, a' are furnished with serrated trailing edges b, b' with plural span-wise, periodic indentations, with the serrations extending from the trailing edge into the airflow behind the trailing edge. The serrations may be provided as part of a new blade. The serrations are provided over a spanwise extent of the trailing edge having a length of about 100 percent of the radius of the blade. As shown in figures 1 and 3, the serrations a'c' are provided at an angle different from 0 degrees relative to a chord of the blade. A serrated panel b, b' may be fixed to the rear edge of the blade, which inherently includes a means for connecting the serrated panel to the trailing edges of the blades. In claim 8, lines 4-5, "means for connecting the serrated panel to the trailing edge of the blades comprising the wind turbine rotor" does not invoke 35 USC 112, sixth paragraph, because the "means for connecting" is modified by the wind turbine rotor being the connecting means. Alternatively, if the "means for connecting the serrated panel to the trailing edge of the blades comprising the wind turbine rotor" is considered to meet 35 USC 112, sixth paragraph, Applicant has not provided any definition in the specification of the "means for connecting the serrated panel to the trailing edge of the blades", and the means disclosed by the German Patent for connecting the serrated panel b, b' to the trailing edges of the blades meets the claimed function. One of ordinary skill in the art would readily recognize that the serrated trailing edges disclosed by the German Patent improve the lift and drag, which inherently improves the efficiency of the wind turbine. As shown in figure 1, the angle of the serrated part/panel changes passively in response to the speed and angle of the airflow at the

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trailing edge due to the flexing of the serrations or serrated panel, shown flexibly moving from position ac to position a'c'.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5 and 10-11, as far as they are definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dassen in view of Vijgen. Dassen discloses a method and an apparatus for improving the efficiency of a wind turbine substantially as claimed as set forth above, including sawteeth. However, Dassen does not disclose that the sawteeth have approximately 60 degrees included angles between adjacent vertices.



Vijgen (figures 2, 3, and 13, for example) shows an airfoil 20 having a trailing edge 24 with a serrated panel 30 having plural spanwise periodic indentations in the form of sawteeth, having an included angle of 60 degrees, for the purpose of improving lift and drag.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the wind turbine of Dassen such that the sawteeth have approximately 60 degrees included angles between adjacent vertices, as taught by Vijgen, for the purpose of improving lift and drag. In column 3, lines 32-37, Vijgen teaches that the principles of the invention may be applied to any aerodynamic lifting surface with sharp or moderately blunt trailing edges such as propeller blades or fan blades. Therefore, because the wind turbine of Dassen includes an aerodynamic lifting surface with sharp trailing edges, it would have been obvious to one of ordinary skill in the art to apply the teachings of Vijgen to the wind turbine blades of Dassen.

Claims 7 and 13, as far as they are definite, are also rejected under 35 U.S.C. 103(a) as being unpatentable over Dassen in view of Crook. Dassen discloses a method and an apparatus for improving the efficiency of a wind turbine substantially as claimed as set forth above, including serrations/panels that are provided at an angle different from 0 degrees relative to a blade chord. However, Dassen does not disclose that the angle of the serrations/panels changes passively in response to the speed and angle of the airflow at the trailing edge due to the flexing of the serrations and/or serrated panels.

Crook (figure 2) shows an airfoil 101 having a trailing edge with flexible fingered regions 109, for the purpose of providing yielding resistance to airflow at the trailing edge, thereby reducing stall and instability.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the wind turbine of Dassen such that the serrations and/or panels are flexible, such that they change passively in response to the speed and angle of the airflow at the trailing edges due to the flexing of the serrations and/or serrated panels, as taught by Crook, for the purpose of reducing stall and instability. Crook is from the analogous art of airplane wings, and one of ordinary skill in the art would have recognized the applicability of the flexible trailing edges of Crook to a wind turbine rotor, because wing sections and blades are of the same cross sectional shapes and deal with the same aerodynamic problems and are thus considered to be analogous to one another.

#### ***Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

King is cited to show a wind wheel with sawtooth-shaped trailing edges.

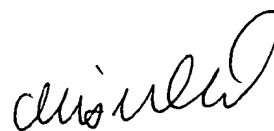
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German Patent 2,527,467 is cited to show an aircraft wing with sawtooth-shaped trailing edges.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (703)-308-2638. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (703) 308-1044. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.



Christopher Verdier  
Primary Examiner  
Art Unit 3745

C.V.  
October 20, 2002